1
00:00:08,790 --> 00:00:07,430
space station live comes to you each day

2
00:00:10,790 --> 00:00:08,800
from the international space station

3
00:00:12,950 --> 00:00:10,800
flight control room inside the

4
00:00:15,030 --> 00:00:12,960
christopher c craft junior mission

5
00:00:17,670 --> 00:00:15,040
control center at nasa's johnson space

6
00:00:20,230 --> 00:00:17,680
center here in houston the control

7
00:00:22,070 --> 00:00:20,240
center was named in honor of nasa's

8
00:00:24,470 --> 00:00:22,080
first human space mission flight

9
00:00:26,950 --> 00:00:24,480
director who is credited as the primary

10
00:00:28,870 --> 00:00:26,960
designer of the mission control concept

11
00:00:30,630 --> 00:00:28,880
the concept was tested from cape

12
00:00:32,790 --> 00:00:30,640
canaveral florida before it supported

13
00:00:35,190 --> 00:00:32,800

its first human space flight

14
00:00:36,270 --> 00:00:35,200
from here in houston 50 years ago on

15
00:00:39,350 --> 00:00:36,280
june 3rd

16
00:00:40,950 --> 00:00:39,360
1965 with the flight of gemini iv

17
00:00:42,869 --> 00:00:40,960
every american human space flight

18
00:00:45,110 --> 00:00:42,879
mission since then has been controlled

19
00:00:48,229 --> 00:00:45,120
from one of several rooms in this

20
00:00:50,069 --> 00:00:48,239
building recently my colleague pat ryan

21
00:00:51,910 --> 00:00:50,079
has spoke with norm knight the current

22
00:00:53,830 --> 00:00:51,920
chief of the flight director office here

23
00:00:55,510 --> 00:00:53,840
in houston about the history of this

24
00:00:57,830 --> 00:00:55,520
place and its contribution to space

25
00:01:00,150 --> 00:00:57,840
exploration he also noted that even

26
00:01:01,670 --> 00:01:00,160
though 50 years has passed there are a

27
00:01:04,950 --> 00:01:01,680
lot of similarities between the

28
00:01:07,990 --> 00:01:04,960
operation then and now

29
00:01:10,149 --> 00:01:08,000
you have a team of individuals that that

30
00:01:12,390 --> 00:01:10,159
comprise the mission control team that

31
00:01:14,630 --> 00:01:12,400
have systems expertise on the vehicle or

32
00:01:16,950 --> 00:01:14,640
spacecraft that uh that they are

33
00:01:18,789 --> 00:01:16,960
protecting and that's exactly what this

34
00:01:20,550 --> 00:01:18,799
team is doing they are protecting the

35
00:01:22,870 --> 00:01:20,560
crew they're protecting the vehicle and

36
00:01:24,550 --> 00:01:22,880
they're achieving the mission objectives

37
00:01:27,109 --> 00:01:24,560
set forth by any program whether it was

38
00:01:29,190 --> 00:01:27,119

a gemini program apollo space shuttle or

39
00:01:30,950 --> 00:01:29,200
space station anything that that is

40
00:01:32,630 --> 00:01:30,960
supported out of this room we're working

41
00:01:34,950 --> 00:01:32,640
for a customer

42
00:01:36,310 --> 00:01:34,960
so this team of people in this room

43
00:01:39,109 --> 00:01:36,320
report to the flight director the flight

44
00:01:41,030 --> 00:01:39,119
director is the risk manager of the team

45
00:01:43,270 --> 00:01:41,040
making those risk trade-off decisions

46
00:01:45,350 --> 00:01:43,280
for the respective programs

47
00:01:47,590 --> 00:01:45,360
again with crew safety vehicle safety

48
00:01:50,469 --> 00:01:47,600
and mission objectives at the forefront

49
00:01:51,990 --> 00:01:50,479
that's in a crux of of how it's done so

50
00:01:54,230 --> 00:01:52,000
from that standpoint

51
00:01:56,709 --> 00:01:54,240
that leadership model that hierarchy is

52
00:01:57,670 --> 00:01:56,719
still here today it functions very

53
00:01:58,950 --> 00:01:57,680
similar

54
00:02:01,510 --> 00:01:58,960
to how it did

55
00:02:03,350 --> 00:02:01,520
in the early days of mission control so

56
00:02:06,630 --> 00:02:03,360
let's talk about some of the differences

57
00:02:09,029 --> 00:02:06,640
with that um leadership transcends

58
00:02:11,029 --> 00:02:09,039
everything so so the leadership model

59
00:02:12,790 --> 00:02:11,039
that that that we had

60
00:02:14,229 --> 00:02:12,800
50 years ago is still alive and well

61
00:02:17,589 --> 00:02:14,239
today in the control center but our

62
00:02:19,670 --> 00:02:17,599
model has changed a little bit relative

63
00:02:21,750 --> 00:02:19,680

uh to how we support the programs and

64
00:02:23,110 --> 00:02:21,760
and that changes based on the vehicles

65
00:02:25,030 --> 00:02:23,120
that we support

66
00:02:26,869 --> 00:02:25,040
we relied on the crew about 90 of the

67
00:02:29,030 --> 00:02:26,879
time for those early programs today with

68
00:02:31,350 --> 00:02:29,040
station the folks you see in this room

69
00:02:33,350 --> 00:02:31,360
are flying the vehicle we send about 80

70
00:02:35,750 --> 00:02:33,360
000 remote control commands out of the

71
00:02:37,990 --> 00:02:35,760
international space station room today

72
00:02:39,670 --> 00:02:38,000
affecting change on board

73
00:02:41,670 --> 00:02:39,680
the international space station and in

74
00:02:44,470 --> 00:02:41,680
doing so we free the crew up to do what

75
00:02:46,550 --> 00:02:44,480
they do best do the research in science

76
00:02:48,710 --> 00:02:46,560
that that we're paying them to do and

77
00:02:51,030 --> 00:02:48,720
taking the risk to go do

78
00:02:52,229 --> 00:02:51,040
obviously the crew has to do things on

79
00:02:54,390 --> 00:02:52,239
board in addition to research and

80
00:02:55,990 --> 00:02:54,400
science that maintenance that requires

81
00:02:57,190 --> 00:02:56,000
change out of equipment

82
00:02:58,790 --> 00:02:57,200
and uh

83
00:03:01,509 --> 00:02:58,800
and different activities that literally

84
00:03:03,350 --> 00:03:01,519
the crew has to have hands on

85
00:03:05,190 --> 00:03:03,360
but the majority of things are managed

86
00:03:07,589 --> 00:03:05,200
today on the ground via the flight

87
00:03:09,830 --> 00:03:07,599
control team one other thing that we did

88
00:03:12,630 --> 00:03:09,840

in station that changed a little bit the

89
00:03:14,309 --> 00:03:12,640
way we uh we do things is with the

90
00:03:16,149 --> 00:03:14,319
earlier programs

91
00:03:18,070 --> 00:03:16,159
typically the flight controllers you saw

92
00:03:19,910 --> 00:03:18,080
in the room represented a single

93
00:03:22,949 --> 00:03:19,920
function in other words you had a life

94
00:03:24,710 --> 00:03:22,959
support officer or you had a power

95
00:03:26,470 --> 00:03:24,720
systems flight controller or

96
00:03:28,869 --> 00:03:26,480
communications and what we did with

97
00:03:30,550 --> 00:03:28,879
station is we have consolidated those

98
00:03:33,270 --> 00:03:30,560
where we can so one flight controller

99
00:03:35,589 --> 00:03:33,280
might be managing three systems today

100
00:03:36,949 --> 00:03:35,599
data processing communication video

101
00:03:39,190 --> 00:03:36,959
whereas in the past that could have been

102
00:03:41,750 --> 00:03:39,200
spread out a little bit so we've

103
00:03:43,110 --> 00:03:41,760
consolidated that and also the room

104
00:03:45,589 --> 00:03:43,120
flexes

105
00:03:47,670 --> 00:03:45,599
contracts and expands based on the

106
00:03:49,430 --> 00:03:47,680
activities of the day if you came in on

107
00:03:50,390 --> 00:03:49,440
a spacewalk day the room's going to be

108
00:03:52,229 --> 00:03:50,400
full

109
00:03:53,830 --> 00:03:52,239
on a weekend when the crew has time off

110
00:03:55,350 --> 00:03:53,840
and the activities are less but folks

111
00:03:57,110 --> 00:03:55,360
are still maintaining and managing

112
00:03:59,589 --> 00:03:57,120
onboard systems you may have four or

113
00:04:00,630 --> 00:03:59,599

five people in the room and typically

114
00:04:03,110 --> 00:04:00,640
most of the front room flight

115
00:04:05,270 --> 00:04:03,120
controllers do not have back rooms today

116
00:04:06,949 --> 00:04:05,280
supporting them so our models changed

117
00:04:08,869 --> 00:04:06,959
but really our brand recognition of what

118
00:04:10,789 --> 00:04:08,879
we're here for protecting the astronauts

119
00:04:12,470 --> 00:04:10,799
protecting the vehicle and achieving

120
00:04:13,990 --> 00:04:12,480
those mission objectives when able

121
00:04:16,229 --> 00:04:14,000
really is our mantra and that has not

122
00:04:18,550 --> 00:04:16,239
been compromised the mission control

123
00:04:20,069 --> 00:04:18,560
center is not just this room that we're

124
00:04:21,670 --> 00:04:20,079
sitting in there are several in the

125
00:04:23,830 --> 00:04:21,680
building including a couple that are

126
00:04:25,430 --> 00:04:23,840
being prepared for future human space

127
00:04:27,030 --> 00:04:25,440
flight tell me what's happening there

128
00:04:28,469 --> 00:04:27,040
correct uh the room that i've been

129
00:04:30,550 --> 00:04:28,479
talking about today so much is a room

130
00:04:32,550 --> 00:04:30,560
we're sitting in today is international

131
00:04:34,310 --> 00:04:32,560
space station flight control room but we

132
00:04:36,790 --> 00:04:34,320
do have other control centers here in

133
00:04:38,390 --> 00:04:36,800
the building and those are being

134
00:04:41,430 --> 00:04:38,400
developed and retrofitted to do our

135
00:04:42,870 --> 00:04:41,440
exploration program and our commercial

136
00:04:45,350 --> 00:04:42,880
support as well

137
00:04:47,510 --> 00:04:45,360
flight operations is supporting boeing

138
00:04:49,430 --> 00:04:47,520

for their uh we're their ops agent of

139
00:04:51,749 --> 00:04:49,440
choice per se for doing flight

140
00:04:53,510 --> 00:04:51,759
operations we're also working uh on our

141
00:04:54,950 --> 00:04:53,520
exploration program recently this last

142
00:04:57,110 --> 00:04:54,960
december we flew

143
00:04:58,390 --> 00:04:57,120
exploration flight test number one and

144
00:04:59,670 --> 00:04:58,400
we flew that

145
00:05:01,430 --> 00:04:59,680
out of what we call the blue flight

146
00:05:03,510 --> 00:05:01,440
control room that room and that

147
00:05:05,110 --> 00:05:03,520
capability being designed for that

148
00:05:08,230 --> 00:05:05,120
mission again it's building off of what

149
00:05:10,310 --> 00:05:08,240
we had in shuttle station it evolves for

150
00:05:11,990 --> 00:05:10,320
capability to uh to handle the

151
00:05:14,070 --> 00:05:12,000
exploration program and our on our

152
00:05:16,870 --> 00:05:14,080
boeing services as we like to call it

153
00:05:17,990 --> 00:05:16,880
you've been here for more than 25 years

154
00:05:20,070 --> 00:05:18,000
do you

155
00:05:22,469 --> 00:05:20,080
hear or see the the history when you

156
00:05:23,270 --> 00:05:22,479
walk around the halls here absolutely i

157
00:05:25,590 --> 00:05:23,280
mean

158
00:05:27,510 --> 00:05:25,600
you know what what i feel when i walk

159
00:05:29,110 --> 00:05:27,520
through these rooms is is the missions

160
00:05:30,950 --> 00:05:29,120
that have taken place

161
00:05:33,350 --> 00:05:30,960
and more than just the missions it's the

162
00:05:35,510 --> 00:05:33,360
teams that were involved with that it's

163
00:05:37,510 --> 00:05:35,520

the teams that came together that are

164
00:05:40,230 --> 00:05:37,520
represented by the folks in the in the

165
00:05:42,070 --> 00:05:40,240
in the flight control room uh

166
00:05:43,990 --> 00:05:42,080
the folks that have worked to do all the

167
00:05:45,749 --> 00:05:44,000
planning and the training of the

168
00:05:47,749 --> 00:05:45,759
astronauts and the flight controllers

169
00:05:50,390 --> 00:05:47,759
the the mission integration to pull all

170
00:05:52,390 --> 00:05:50,400
the details together so that that when

171
00:05:53,510 --> 00:05:52,400
when that mission takes place

172
00:05:55,990 --> 00:05:53,520
everyone knows their roles and

173
00:05:57,670 --> 00:05:56,000
responsibilities how to respond and when

174
00:05:59,830 --> 00:05:57,680
things go wrong

175
00:06:01,350 --> 00:05:59,840
know how to respond appropriately to

176
00:06:03,270 --> 00:06:01,360
those and have that critical thinking

177
00:06:05,350 --> 00:06:03,280
and that human judgment

178
00:06:07,029 --> 00:06:05,360
as part of that so so i feel that

179
00:06:08,950 --> 00:06:07,039
whether it's you know when i'm in the

180
00:06:10,390 --> 00:06:08,960
apollo uh

181
00:06:12,309 --> 00:06:10,400
flight control room the national

182
00:06:14,150 --> 00:06:12,319
historic landmark or in the old shuttle

183
00:06:16,710 --> 00:06:14,160
room that's now being retrofitted right

184
00:06:19,510 --> 00:06:16,720
for the exploration program i i feel

185
00:06:22,469 --> 00:06:19,520
that but what it provides me is

186
00:06:24,870 --> 00:06:22,479
you know if you have a vision

187
00:06:27,029 --> 00:06:24,880
and you clearly articulate that vision

188
00:06:28,790 --> 00:06:27,039

you put the right people on that team

189
00:06:30,070 --> 00:06:28,800
teams of individuals that can go do this

190
00:06:31,830 --> 00:06:30,080
whether it's one team or with the

191
00:06:33,029 --> 00:06:31,840
international space station multiple

192
00:06:34,870 --> 00:06:33,039
teams

193
00:06:36,550 --> 00:06:34,880
in international cooperation as well

194
00:06:39,029 --> 00:06:36,560
with those teams

195
00:06:40,309 --> 00:06:39,039
and you fund it you can do anything

196
00:06:42,070 --> 00:06:40,319
people thought the expert or the

197
00:06:44,390 --> 00:06:42,080
international space station

198
00:06:46,629 --> 00:06:44,400
uh you know would never come to fruition

199
00:06:48,469 --> 00:06:46,639
and look at it today it is a beautiful

200
00:06:51,029 --> 00:06:48,479
orbiting laboratory providing science

201
00:06:53,589 --> 00:06:51,039
and research it's providing a platform

202
00:06:55,909 --> 00:06:53,599
to to expand our exploration knowledge

203
00:06:57,430 --> 00:06:55,919
to expand our systems knowledge

204
00:07:00,390 --> 00:06:57,440
with the life support systems that'll be

205
00:07:01,749 --> 00:07:00,400
needed to get to an asteroid or mars and

206
00:07:03,990 --> 00:07:01,759
and so when i walk through the building

207
00:07:06,150 --> 00:07:04,000
and i feel that it gives me confidence

208
00:07:08,070 --> 00:07:06,160
that i know that these visions that are

209
00:07:10,230 --> 00:07:08,080
being set forth today that we go wow an

210
00:07:12,550 --> 00:07:10,240
asteroid or mars that looks really hard

211
00:07:14,390 --> 00:07:12,560
you know in some cases can we do it we

212
00:07:17,189 --> 00:07:14,400
know we can do it we'll find a way the

213
00:07:19,270 --> 00:07:17,199

team is resilient it's ready to go

214
00:07:20,870 --> 00:07:19,280
and uh and knowing that that will come

215
00:07:23,270 --> 00:07:20,880
to fruition because you build on your

216
00:07:25,510 --> 00:07:23,280
past to get to these future endeavors

217
00:07:27,350 --> 00:07:25,520
norm thanks for your thoughts on this

218
00:07:28,790 --> 00:07:27,360
50th anniversary of the mission control

219
00:07:30,710 --> 00:07:28,800
center my pleasure

220
00:07:32,150 --> 00:07:30,720
norm knight is the chief of the flight